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## PATENT ABSTRACTS OF JAPAN

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(30) Priority:	(71) Applicant: <b>ASAHI OPTICAL CO</b>
(43) Date of application publication: <b>12.12.00</b>	(72) Inventor: <b>OUCHI TERUO</b>
(84) Designated contracting states:	(74) Representative:

### (54) **SWALLOW TYPE ENDOSCOPIC DEVICE**

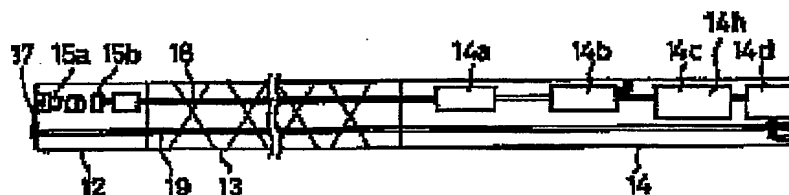
(57) Abstract:

**PROBLEM TO BE SOLVED:** To lessen the pain on a testee by disposing a curving part which is curvable along the curving of a celom into an endoscope consisting of a bar-like body and building an illumination means, an observation means, a signal transmission means for radio transmitting the observation image obtained by the observation means and a power source supply means into the bar-like body.

**SOLUTION:** The endoscope receives a manipulation signal from an extracorporeal signal transmission section of an external apparatus by a signal reception/transmission means 14b in the body and remotely manipulates the respective parts. The power source supply means 14c executes power supply by utilizing microwaves. Illumination light is supplied to an illumination window of a rigid part 12 by an

LED which obtains electric power via a signal line 18 from the power source supply means 14c. The image of a subject is formed on an image pickup surface of a CCD 15b by an objective optical system 15a. The image signal outputted from the CCD 15b is amplified in an amplifier circuit 14a, is transmitted from a signal reception/transmission means 14b and is received in the extracorporeal signal reception section of the external apparatus. The received image signal is processed in a video circuit of the external apparatus and is observed on a monitor.

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# CLAIMS

CLAIM 1: A "Drink-in" endoscope that is made of an imaging body of a cylindrical shape that can be swallowed into a body cavity through the mouth, and an apparatus outside the body and between the two-- the imaging body and the apparatus outside -- there is no mechanical connection.

The endoscope body is made of the above mentioned cylindrical shape body, a part of which is bendable so as to bend according to the curves of the body cavity. In the above-mentioned cylindrical shape body, there is a viewer and an illuminating device and a transmitter that transmits pictures wirelessly, and an electronic source supplier.

And in the electronic source supplier part outside of the body, there is a receiver that receives the pictures wirelessly from the viewer mentioned above.

CLAIM 2: In the endoscopic device that can be swallowed, which is mentioned in claim 1 above, the bendable component has a bending drive that can operate the bending and a flexible part that can transform its shape when an outside force is increased. They receive operating signals wirelessly from the external apparatus.

In the external apparatus, there is a device, which is part of the endoscope, and which sends the operation signals wirelessly.

CLAIM 3: The endoscopic device has, on one end of the cylindrical shape body that is mentioned above in Claims 1 and 2, a hard part that consists of: the viewer component and the illuminating device (in this order) as well as the bendable component mentioned above.

CLAIM 4: At the end of the endoscope claimed in Claim 2, the cylindrical shape body has, on one end, a hard part that consists of: the viewer component and the illuminating device (in this order), as well as the bending driver component and the flexible component.

CLAIM 5: The wireless bending driver in the endoscopic device claimed in Claim 2 is a device that has wires in the bending driver (made of) an alloy that memorizes shapes and a device that selectively heats the wires of the bending driver.

CLAIM 6: The electronic source supplier of the endoscope device, claimed in each of the Claims 1 to 5, has a battery.

CLAIM 7: The electronic source supplier at the end of the endoscope claimed in Claims 1 to 5 is a device that supplies microwaves originating outside the body as a functioning electronic source, and this supplier of microwaves to the endoscope is in the external apparatus.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL00/00349

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) :Please See Extra Sheet.

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 359/363, 367, 385-387, 846, 853, 860, 867-869; 250/201.02, 201.03; 222.2, 239, 574; 362/335, 346, 347, 350;

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

curve\$ or ellip\$, window, illuminati\$, receiver or camera or ccd or detector, focal or focus\$ or foci, endoscope or capture

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3,745,325 A (HARVEY) 10 July 1973 (10/07/1973), see columns 2-3 and fig. 3.	1-3, and 5
X — Y	JP 63-200115 B (YABE) 18 August 1988 (18/08/1988), see English abstract, pages 95-97 and fig. 1.	6-9, 11-12 — 1-5, 10
Y	US 4,005,287 A (COOK) 25 JanUARY 1977 (25/01/1977), see columns 2-3 and fig. 1.	1-4 and 10
A	US 4,596,050 A (ROGERS) 17 June1986 (17/06/1986), see the entire document.	1-12

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	*T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A document defining the general state of the art which is not considered to be of particular relevance	*X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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*L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*& document member of the same patent family
*O document referring to an oral disclosure, use, exhibition or other means	
*P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

31 OCTOBER 2000

Date of mailing of the international search report

27 NOV 2000

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## A. CLASSIFICATION OF SUBJECT MATTER:

IPC (7):

A61B 1/00; G02B 21/06, 21/36, 5/08, 5/10; F21V 5/04, 7/00; G02B 27/40; H01J 40/14

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